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Show me the Money: the Impact of Funding on Entrepreneurship Education at German Universities

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ABSTRACT

This article examines the current characteristics of Entrepreneurship Education (EE) at German universities. We first assess the degree of alignment between course objectives and corresponding contents on an individual course level. As a result, we find a low degree of alignment. In the second part of our analysis we show that the German universities in our sample predominantly use internal funds for their EE courses (75%), followed by external state funding (12%) which mostly stems from German federal sources. Moreover, a third of the sample shows a funding mix, with the majority attracting half of their budget from one or two external sources. In the final part of our analysis we assess the implication of the funding type on the design of EE and are able to show characteristic course profiles for two funding types. Overall, this article demonstrates that types of funding are key drivers for EE design, a fact that hitherto has not been accounted for.

Key words: Entrepreneurship Education, Educational Finance, Financial Sustainability, Funding Mix, Funding Implications.

INTRODUCTION

The role of entrepreneurship in economic growth has been widely recognized (e.g., Schumpeter, 1934; Drucker, 1985), and the required skill set for successful entrepreneurs has been largely established (e.g., McClelland, 1987; Timmons, 1994). Investing into teaching and training of potential entrepreneurs is thus seen as worthwhile (cf. Charney and Libecap, 2000). Research into Entrepreneurship Education (EE) is abundant, and many studies confirm a positive effect of EE on students' entrepreneurial interest, attitudes and financial performance (e.g., Peterman and Kennedy, 2003; Kuratko, 2005; Fayolle *et al.*, 2006; Pittaway and Cope, 2007; Mueller, 2009; Martin *et al.*, 2013). Even critics of the benefit of EE acknowledge that entrepreneurial skills can at least partly be acquired through training (Brockhaus, 1993; Aronsson, 2004; Haase and Lautenschläger, 2011b). EE has consequently turned into a political priority on national and supranational agendas. Two out of the eight key competences for life-long learning set out by the European Union (EU) are key to starting up a business: *Sense of initiative and Entrepreneurship* (cf. Recommendation 2006/962/EC by the European Parliament and European Council, 2006). In consequence, European funding for EE encompasses both national and supranational (i.e., EU) sources. In addition to this increased diversity of public funds, universities have successfully started to attract private co-funding for their EE activities.

The current challenge is thus not so much to attract enough short- and mid-term EE funding, but how to best combine the diverse sources in order to ensure long term support. An OECD-study on EE at Higher Education Institutions (HEIs) identifies sustainability as "the main issue" of public EE funding in Europe (Wilson, 2008, p. 130). The objective of becoming self-financing

over time is even increasingly a prerequisite for obtaining public EE funding in Germany (cf. Kulicke, 2010). The ongoing debate is therefore not about the justification of the investment itself, but about monitoring and qualifying its outcomes for policymakers, funding agencies and donors, and HEIs.

In this context the case of Germany is of interest, because the country's national policy makers are comparatively supportive of EE funding and EE at university level can boast an above-average rating (Sternberg and Lueckgen, 2005). This raises the question whether these two facts are related to each other. With regard to the funding of EE at universities, Germany has followed the example of the UK and the US, where endowments were critical in establishing entrepreneurship at HEIs (Klandt, 2004). German entrepreneurship chairs are at present mostly financed through third-party funding (Schleinkofer and Kulicke, 2009; Klandt *et al.*, 2008). The development from private to public funding results in a growing complexity: At German universities the entrepreneurship chair, its EE program, and individual courses may each be funded through different sources. The German context is thus unique in that staff working with a chair may be funded by various types of sources. Yet most studies on EE funding sources in Germany only analyze the funding of entrepreneurship chairs (e.g., Schleinkofer and Kulicke, 2009; Klandt, 2004), which leads to a research gap with regard to the "micro-funding" of EE at the course level and its implications.

Our study aims at filling this gap in order to increase transparency for policymakers, funding agencies, private donors and HEIs. To that end we assess the design of individual courses, their respective funding, and any resulting patterns through the following research questions:

1. What is the **current funding mix of EE** at the level of individual courses at German universities?
2. What **EE designs** does our sample encompass?

3. Does the **funding** of an EE offering have an **impact on its EE design, and if so, how?**

The article will explore these research questions along the following structure: a) a brief review of available EE funds and of the trend towards a funding mix in German EE, resulting in a working definition of EE funding; b) an overview of our research methodology which links the assessment of EE course designs to the underlying course funding; c) a discussion of the results for EE course designs, funding structure and impact on EE course content; and d) key conclusions applied to a German and European context.

LITERATURE REVIEW

What types of funding are available for EE?

EE funding types can be classified by three characteristics: (1) their origin, (2) their availability over time and (3) their resulting allocation in the university budget.

In most OECD-countries, EE funding is available from a range of public and private sources (Wilson, 2008). Funds can be further distinguished by their varying availability over time into short-, medium- and long-term as well as by their budgetary allocation into internal and external.

These three characteristics of EE funding may vary in their composition when looking at different levels of EE.

At **university level**, EE funding in Europe predominantly comes out of national budgets (Wilson, 2008). Whilst in Europe, this type of public funding can be considered *internal*, because of its recurrent nature, the private share of EE funding at university level has increased in recent years (cf. Wilson, 2008). In contrast, top universities and business schools in the United States, such as Harvard University and Babson College, were entirely set up on endowments.

At the **level of the entrepreneurship chair**, private funding has always played a key role, both in the US and in Europe. Yet the main providers of private funding are different. In the US, most of the funding for entrepreneurship centers and chairs is provided by alumni who have successfully started their own company (Wilson, 2008, p. 129). Whilst this type of private funding is still in its infancies in Europe, other types of private funding traditionally provide start-up finance for EE in European countries, particularly in Germany. In fact, EE in Germany was “kick-started” by private funding. The most prominent example is the first chair for entrepreneurship in Germany which was endowed in 1998 by Deutsche Ausgleichsbank, today “Public SMEs and Entrepreneurship Bank” of KfW (cf. Klandt, 2004).

In recent years, the German government’s “High-tech Strategy for Germany” has marked the beginning of the funding program EXIST. Its funds are allocated by the German Federal Ministry of Economics and Technology (BMWi) and are aimed at “improving the entrepreneurial environment at universities and research institutions and at increasing the number of technology and knowledge based business start-ups” (cf. EXIST-website). The program is co-financed by the European Social Fund (ESF).

Finally, German universities can seek external funding for **individual EE offerings**. Types of such external funding encompass sponsoring as well as earmarked public funding. An example for the latter is EE funding under the European Social Fund (ESF).

To conclude, the broad range of funding from diverse sources available to EE in Germany is illustrated by the following table.

Type of external funding/ level of EE	University	Chair	EE Program	EE Course
Public national	EXIST	--	EXIST	--
Public supranational	--	--	European "Knowledge and Innovation Communities" (KICs, e.g., Climate-KIC)	European Social Fund (ESF)
Private	Private endowment, e.g. Hasso Plattner Institut	Corporate endowments, e.g. SAP-chair at Humboldt University Berlin, Siemens-chair at Technical University Berlin	--	Corporate sponsoring

Figure 1: Examples of funding in German EE at different levels

Overall, this increase in funding sources for EE at different levels has resulted in a trend towards a funding mix.

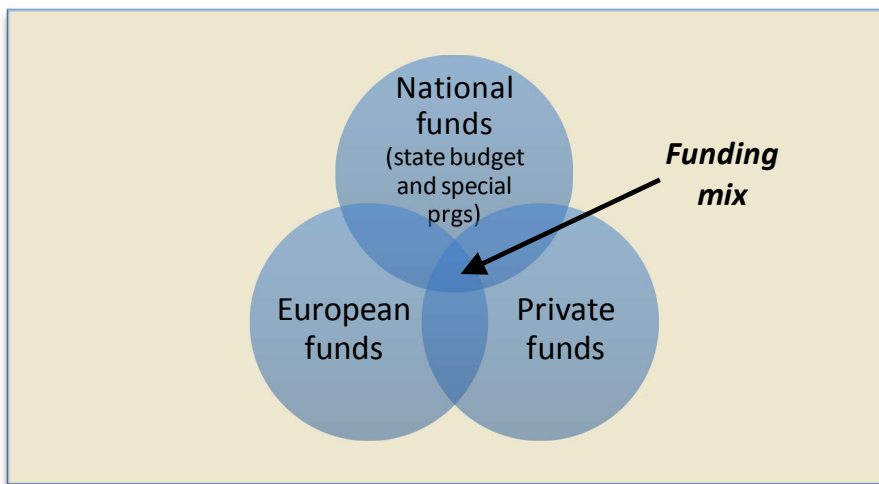


Figure 2: Current sources of funding in German EE and resulting funding mix

What do we know about the funding mix in German EE?

A review of literature on EE funding in Germany uncovers a number of gaps. Whilst it is known that university funding in Germany is largely provided by the state (cf. Wilson, 2008), studies

on EE funding mostly focus on the level of entrepreneurship chairs and its recent development (e.g., Schleinkofer and Kulicke, 2009; Klandt *et al.*, 2008; Klandt, 2004). We thus know that in 2004, their average annual budget was EUR 250,000 (Uebelacker, 2005, p. 131). Moreover, in the same year 50% of entrepreneurship chairs were fully funded through private money, 36% of chairs were fully financed through public funding, while the remaining 14% of entrepreneurship chairs had a diversified funding base of public and private sources (Klandt *et al.*, 2005, p. 24). The most common form of private funding was co-funding through endowments and sponsoring. Sponsors would usually earmark their funds for specific seminars and business plan competitions (Uebelacker, 2005).

The funding of staff at entrepreneurship chairs is similarly well researched: 75 percent of entrepreneurship professors (including entrepreneurship-related chairs) and 40 percent of their research assistants are paid for by the university, while the remaining 25 percent of professors and 60 percent of their staff are funded through external sources (Klandt *et al.*, 2008, p. 41).

Looking at the extent to which EE is embedded at German HEIs, at the players and their offerings, German EE shows a continued trend towards the creation of entrepreneurship chairs by endowment (Klandt *et al.*, 2008; Schleinkofer and Kulicke, 2009). The most recent study by the German Association for Entrepreneurship-Research, -Education and -Policy (FGF e.V.) reports a 40.5%-share of endowed entrepreneurship chairs at universities (Klandt *et al.*, 2008, p. 33). It is a specificity of funding in German education that many so-called endowed funds for German professorships are based on corporate sponsorship and are not of a long-term nature (cf. Klandt, 2004). Whilst endowed positions in the US are permanently paid out of large funds' proceeds, German endowments only aim at kick-starting entrepreneurship activities. The average period for endowment of three to five years clearly presents an

“impending threat” to German entrepreneurship chairs, with regard to continuing their activities over a longer period, as Klandt (2004, p. 299) points out. Owners of such endowed chairs have to establish a funding mix in order to become financially sustainable. Despite these research efforts, none of the existing studies has investigated the potential impact of funding on the design of EE courses.

What are drivers and implications of the trend towards a funding mix?

The German trend towards an EE funding mix is largely driven by two developments: the expiry of endowments and the introduction of new public EE funds both on national and on European level. It is supported by the international trend among universities to become *entrepreneurial universities* (Clark, 1998b). As introduced by Clark (1998a), this concept encompasses five key areas within a university: *“a strengthened managerial core; an enhanced developmental periphery; a diversified funding base; a stimulated academic heartland; and an entrepreneurial culture”* (p. 5).

There are two drivers behind universities’ striving for a diversified funding base: first, universities and their staffs want to reduce their dependency on a single source of financial support; second, and as a result of this, universities want to ensure the sustainability of all offerings, including their EE activities. Yet the process to actively seek funding ideally requires a funding strategy.

In addition to these strategic challenges, an increased number of financial partnerships inevitably leads to higher operational complexity and thus to an increased coordination effort. A further consequence of this trend is that mixed funding will require an alignment of EE activities’ design, because different funding types target different student profiles with potentially different learning outcomes. Depending on the underlying funding, an individual

course might therefore have to cater to the needs of more than one target audience, in line with the requirements by diverse funding providers.

This raises the question whether the different sources of funding impact on the universities' EE course design yet. In order to answer it, our investigation assesses whether a university's EE course design is influenced by the following four sources of funding:

1. National budget for HEIs
2. National funds for entrepreneurship programs (e.g., EXIST)
3. European funds for entrepreneurship programs (e.g., European Social Fund (ESF))
4. Private funds (e.g., foundations, corporate funds, private individuals).

How can EE designs be assessed?

To assess the EE designs in our sample, we will focus on two design characteristics: on the pre-defined objectives of an EE course, as well as on the applied teaching and learning contents.

Our review of current publications on EE design shows an inconsistent use of terminology across the discipline. Most notably, publications do not categorize EE teaching elements that allow to distinguish consistently between a teaching method and a teaching or learning content. To give an example, different scholars refer to the term “simulation” both as a teaching or learning *content* (cf. Schmette, 2007) and as a teaching *method* (cf. Haase and Lautenschläger, 2009; Mwasalwiba, 2010). The fact that this notional overlap and resulting inconsistent use of terminology are found in both international and German publications underlines that it is not an issue of translation from English into German (cf. also Walterscheid, 1998).

In order to avoid such inconsistency, the following figure illustrates the hierarchy of educational terminology as applied in our article, with examples for course objectives, teaching and learning contents as well as teaching methods in EE.

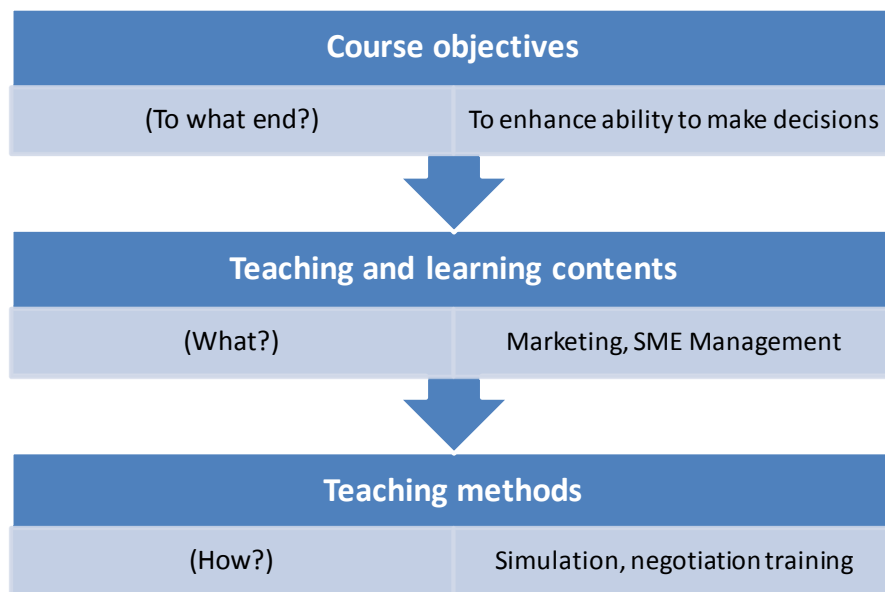


Figure 3: Hierarchy of educational terminology as applied in the present article

Working definition “EE funding”

As shown, EE funding can stem from diverse sources and can be applied to different levels. For the purpose of our study we focus on funding at the level of an individual offering. We thus refer to the term “EE funding” as follows:

***EE funding** can be any source of monetary financing of an entrepreneurship course, be it national, supranational or private. Non-monetary support is not considered as EE funding in this study, but rather as network support of EE.*

RESEARCH METHOD

This study builds on a survey carried out at German private and public universities in 2010.

Sample

In order to obtain our sample of entrepreneurship educator profiles, we have identified over 500 EE offerings at 76 universities. We have applied simple random sampling with a stratified

element (individual courses only, no complete EE programs), combined with a systematic element (curricular courses only, with credit points allocated). Special Master programs in Entrepreneurship or pure academic offerings were not included in the sampling. The result is a sample of 76 curricular EE offerings, with one EE course each per university. We then contacted the 76 entrepreneurship scholars in charge of running the respective course and have received 45 valid survey questionnaires, corresponding to a response rate of 59%.

Measurement

We use multi-item scales drawn from literature on EE. However, as empirical research with EE courses as the unit of analysis is new, well-established scales covering all aspects that are relevant to this study are scarce. As a result, we combine established scales and incorporate additional items as necessary. All items are measured on a Likert-scale from 1 “strongly disagree” to 5 “strongly agree”.

For the purpose of profiling the current EE design, we focus on two characteristics of the courses in our sample, measured as variables: first, we ask for the course’s objectives (e.g., to enhance the participant’s competencies in decision making). Secondly, we ask for the course contents (e.g., business planning elements). In both cases, the respondent is given a menu of options, where multiple answers are possible.

In addition, we survey the types of the course’s underlying funding (i.e., internal budget, external private funds, external European funds, external federal funds, as well as other) and the type’s respective share of course funding in percent.

Data analysis

In a preparatory step, we conducted an exploratory factor analysis (EFA) for the two EE design characteristics chosen. We thus examined if there were any common underlying dimensions for the diverse course objectives respectively contents, which would allow us to derive factors.

This identification of factors for course objectives and course content elements allowed us to reconcile EE design for the different combinations of characteristics in our sample.

Finally, we conducted correlation analyses (Spearman) for the combinations of course objectives and course contents (i.e., their factors) at the significance levels of 1%, 5% and 10%.

As we did not assume a one-way relationship between both types of extracted factors, we applied a two-sided test.

To identify significant differences in the design characteristics depending on the respective funding type, we conducted non-parametric tests (Mann-Whitney U) at the significance levels of 1%, 5% and 10%.

RESULTS

Funding structure of EE in Germany

The analysis of the 44 courses in our sample confirms that there is no consistent funding mix of EE on an individual course level at German universities. The following table shows the sample's funding structure.

	Internal sources: University budget funds	External sources: Federal funds (incl. EXIST)	External sources: Private funds	External sources: EU funds (incl. ESF)	External sources: Other
Mean	75.00	11.74	8.94	3.41	.91
Standard deviation	36.19	26.68	23.33	12.75	4.2
Median	100.00	0	0	0	0
Mode	100.00	0	0	0	0
Minimum	0	0	0	0	0
Maximum	100	100	100	50	20

Table 1: Funding structure of the sample (in %)

Based on an evaluation of internal and external funding categories, the funding mix in our sample is characterized as follows:

The share of internal funding of EE courses is still high

An average of 75 percent of the courses in our sample are at least partly internally funded, with as many as 64 percent of courses being fully funded through university budgets. At the same time, 22 percent of the responding universities are private entities or foundation-based. Even if we take into account the possibility that all of them might have regarded their courses as “internally funded” rather than “privately funded”, the share of internal funding would still amount to as much as 53 percent.

External funds mostly stem from German federal sources

The second most occurring funding in the sample are external funds provided by the German federal government (hereafter referred to as “federal funds”). Such federal funds include those earmarked for the EXIST-program (cf. section on funding types above), which contributes an average funding share of 12 percent to an individual course. Private external funds (incl. endowments) rank third, with an average funding share of 9 percent in our sample.

A third of the sample shows a funding mix, but a truly diversified funding base is rare

32 percent of courses in the sample have more than one source of funding, the majority attracting half of their budget from one or two external sources.

In contrast, only 10 percent of the sample displays a funding mix of three different sources, i.e. internal, private and external federal funding (incl. EXIST). The same share applies when evaluating courses for being exclusively funded by one single external source.

As external co-funding through European funds (incl. ESF) only occurs in three cases in our sample, we decided against an evaluation of this type of co-funding’s potential impact on EE design.

Alignment of EE design in Germany

After a preliminary analysis of the design of the 45 courses in our sample we have extracted six factors for underlying course objectives and five factors for course content. A Spearman's correlation analysis reveals characteristic content profiles for five of the six objectives' factors.

Course objectives factors (OF)/ Course content factors (CF)	OF1: Enhancing general social interaction competency	OF2: Enhancing competencies preparing for actual start-up (incl. quantitative target)	OF3: Enhancing leadership competencies	OF4: Enhancing competencies in decision making and openness to risk	OF5: Enhancing idea generation competencies	OF6: Enhancing perseverance competencies
CF1: Adaptive teaching and learning arrangements (transfer-oriented)	0.183	0.485**	-0.143	0.081	0.168	0.276[†]
CF2: Action and simulation	0.414**	-0.161	0.241	-0.060	0.012	-0.260[†]
CF3: Receptive teaching and learning arrangements (teacher-centered)	-0.399**	0.146	0.031	0.048	0.042	-0.082
CF4: Teaching and learning arrangements with discussion and practical relevance	0.077	0.199	0.109	0.298[†]	0.029	0.067
CF5: Teaching and learning arrangements using technology (here: video case study)	-0.048	0.043	0.226	0.274[†]	-0.323*	0.035

*Table 2: Alignment of factors derived for course objectives and course content elements in the sample (Spearman's correlation analysis, significant values highlighted for three levels: [†] $p < 0.1$; * $p < 0.05$ and ** $p < 0.01$, two-sided)*

As illustrated by the table above, we identify five significant profiles of EE design in the sample.

Strong correspondences between extracted factors, however, are the exception, not the rule.

An example of a significant profile is the strong correspondence between a factor of course objectives “enhancing competencies preparing for the actual start-up” (OF2) and a factor of course contents showing “adaptive teaching and learning arrangements (transfer-oriented)” (CF1). Yet we do not find any correspondence between this set of key course objectives (OF2) and more related teaching and learning arrangements “with discussion and practical

relevance” (CF4). Furthermore, the set of course objectives around “leadership competencies” (OF3) does not significantly correspond to any underlying set of content in current EE.

Overall, we conclude that there does not seem to be a clear alignment between objectives and contents in the sample’s EE design.

Potential impact of funding on EE design

To assess the potential impact of funding sources on EE design, we focused on an analysis of two shares of funding: EXIST and private funding. To this end, we conducted non-parametric tests (rank sum tests) for the identified EE design characteristics. We then analyzed whether the course in the sample was partly financed by either type of funding or not. Our findings show that EE design differs considerably between courses financed by one or the other of these two funding types.

EXIST-funding

For courses with EXIST-funding, a Kruskal-Wallis H-test confirms the pursuit of one individual course objective as well as the employment of one extracted content factor and one individual content element to be of statistical significance. A share of EXIST-funding thus has an impact on EE design, by promoting the three aspects of (1) a course objective of **enhancing participants’ business expertise** ($p = .085$), (2) the content of **adaptive and transfer-oriented** nature in general ($p = .078$), and (3) the individual element of **business planning** ($p = .028$) in particular.

Private funding

For courses with private funding, testing reveals a remarkably detailed EE design profile. Not only does it support a connection of this type of funding with the pursuit of two course objective factors and five individual course objectives, but it also shows significant results for

the employment of a content factor as well as for two individual content elements. More specifically, a share of private funding seems to have the implication of promoting the overall objective of **enhancing general social interaction competency** ($p = .001$) and individual objectives, such as the **abilities to cooperate** ($p = .002$) and **to work in a team** ($p = .012$). The latter both show a corresponding loading onto the mentioned factor objective.

In addition, our testing confirms a second factor objective (i.e., **enhancing competencies preparing for the actual start-up**, $p = .045$) to be of statistical significance for courses with private funding. Furthermore, private funding seems to be linked to an EE content profile, by favoring **adaptive and transfer-oriented content** ($p = .080$), and the specific content elements of **building a team** ($p = .008$) and **an own start-up in the course of the seminar** ($p = 0.054$).

Summary of findings

Overall, our findings illustrate a clear difference between the funding mix of entrepreneurship chairs at German universities (in particular the trend towards endowed chairs with a quoted 41 percent of German entrepreneurship chairs, cf. Klandt *et al.*, 2005) and the funding mix of individual EE courses (cf. Table 3).

Funding type	Funding at level of entrepreneurship chair (Klandt et al., 2005, p.24)	Funding at level of EE course (present study)
Public funding (100%)	36%	Max. 68% Min. 46% (when accounting for 22% private universities in the sample)
Private funding (100%)	50%	Max. 24% (when accounting for 22% private universities in the sample) Min. 2%
Mix of public and private funding	14%	32%

Table 3: Comparison of funding mix between level of chair and course (sample)

Moreover, the results reported above show that the funding type and thus a funding mix may have an impact both on course objectives and on course contents of EE:

- The difference in EE design profiles between both types of funding evaluated is little surprising, neither with regard to the promoted competencies, nor to the favored content.
- The level of detail, however, is new. Especially the finding of a statistically significant link between EXIST-funding and the enhancement of participants' business expertise suggests that the German EXIST-program currently puts a strong focus on training commercial skills. In contrast, the finding for private funding enhancing (multiple) social interaction competencies implies that privately funded courses take commercial skills for granted, and can subsequently train more diversely.
- Furthermore, it is remarkable that only private funding seems to target the enhancement of the bundled competencies preparing for actual start-up.

It is worthwhile pointing out that due to the cross-sectional design of our study we do not know if the sample's characteristics reported above are the result of prior planning and are thus sustainable, or if they will change over time. This applies as much to the EE design characteristics as to the respective underlying funding.

CONCLUSIONS AND IMPLICATIONS

Our study demonstrates that the current funding mix at the level of the individual EE course at German universities is as follows (cf. Table 3):

- Accounting for 22 percent of private universities in the sample, a minimum of 46 percent of courses in the sample are fully funded by public money, while a maximum of 24 percent are fully supported by private means.
- The remaining 32 percent combine public and private funding.

In conclusion, the funding mix differs between the level of entrepreneurship chair (cf. Klandt et al., 2005, p. 24) and the level of EE course (cf. our sample). Notably the number of fully

privately funded courses is substantially lower than that of fully privately funded (endowed) chairs. In addition, the funding base of individual EE courses is more diversified than that of chairs.

With regard to the EE designs in our sample, our finding of a low degree of alignment between course objectives and contents confirms previous research (cf. Fiet, 2001; Halbfas, 2006; Haase and Lautenschläger, 2011b).

In addition, our study demonstrates that the type of funding, including funding mixes, may impact on EE design. While the EXIST-program appears to put a strong focus on training commercial skills, privately funded courses train more diversely. Most notably, of the two types assessed, only private funding seems to aim at preparing course participants for actually starting up.

Implications for EE theory

Our study leads to the following three key contributions: For the first time, it unveils the detailed funding structure at the level of the individual EE course, which indeed differs from the structure at chair level; in addition, it provides further evidence that EE design characteristics are not yet aligned; finally, and most importantly, not only does it confirm an impact of funding on EE design, but it also exemplifies how funding and EE design are interlinked.

Implications for EE practice

The current findings have two immediate implications: on the one hand, a need for universities and chairs to design a funding strategy for their EE; on the other hand, the requirement for entrepreneurship pedagogics and didactics to align EE design.

First and foremost, a university's funding strategy for their EE should not only be diversified, but it should also consider all levels, i.e., identifying suitable financiers for a chair as well as for individual EE activities. With an increasing range of target groups (cf. Kuckertz, 2011; Haase and Lautenschläger, 2011a) and new methodologies (cf. Solomon, 2007; Haase and Lautenschläger, 2009), a diversified funding base will be key in maintaining a university's EE activities.

Secondly, to achieve better alignment of EE design, we propose working towards a mutual understanding of EE terminology. In line with the Oslo Agenda for EE in Europe (cf. OECD, 2006), providing specific training to educators will help to establish such terminology. Introducing qualification standards for EE university staff - as set up by the International *Network for Teaching Entrepreneurship* (NFTE) for school staff (cf. Volkmann *et al.*, 2009) - might follow thereof.

Limitations and recommendations for future research

We have evaluated a snapshot of courses' funding profiles on a national level and their implications for EE design. The findings of our study confirm the importance of the individual EE course as level of analysis. At the same time, the shortcomings of this cross-sectional single-informant design focusing on one country lead to three directions for complementary research: It would be of interest to conduct a second study to confirm if the design and funding profiles reported in this cross-sectional study were actually intended, or are **changing over time**. A further complementing study design would be a **multi-level approach**, extending the current single-informant design (i.e., one respondent per entrepreneurship chair and course) to further levels within university. A suitable group of informants might be students who participated in a course, surveyed by an ex-post study.

A further promising area for future research would be to conduct **comparative studies** in a national context (i.e., including other HEIs such as universities of applied sciences) or in an international context.

The call for sustainability of EE funding leads to the research question which funding mix might be best suitable to achieve this goal. In this context, our finding of a difference of funding mixes between levels suggests that **a sustainable funding mix** might differ between universities as well as between individual courses. An example of a sustainable EE funding structure for further investigation is the case of the public HEI Technical University Munich (TUM), which established a separate private entity called UnternehmerTUM GmbH. UnternehmerTUM GmbH is the university's Center for Innovation and Business Creation and leads the university's EE.

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References

- Aronsson, M. (2004). Education Matters - But Does Entrepreneurship Education? An interview with David Birch. *Academy of Management Learning and Education* **3** (3), 289–292.
- Brockhaus, R. H. (1993). Entrepreneurship education: a research agenda, in: Klandt, H./ Müller-Böling, D. (Hrsg.): IntEnt 92 - Internationalizing Entrepreneurship Education and Training (IntEnt), Proceedings of the IntEnt92 Conference Dortmund (Germany), June 23-26, 1992, Köln, Dortmund, 3-7.
- Charney, A., and Libecap, G. D. (2000). *Impact of Entrepreneurship Education*. INSIGHTS A Kauffman Research Series. Kansas City, MO: Kauffman Center for Entrepreneurial Leadership.
- Clark, B. R. (1998a). *Creating Entrepreneurial Universities: Organizational Pathways of Transition*. Oxford: IAU Press/ Elsevier.
- Clark, B. R. (1998b). The Entrepreneurial University: Demand and Response. *Tertiary Education and Management* **4** (1), 5-16.
- Drucker, P.F. (1985). *Innovation and Entrepreneurship*. New York: Harper and Row.
- European Parliament and European Council (2006). Recommendation 2006/962/EC of 18 December 2006 on key competences for lifelong learning. Official Journal L 394 of 30/12/2006. Website http://europa.eu/legislation_summaries/education_training_youth/lifelong_learning/c11090_en.htm, last access: 08 October 2012.
- Fayolle, A., Gailly, B. and Lassas-Clerc, N. (2006). Assessing the impact of entrepreneurship education programmes: a new methodology. *Journal of European Industrial Training* **30** (8/9), 701-720.
- Fiet, J.O. (2001). The Theoretical Side of Teaching Entrepreneurship. *Journal of Business Venturing*, **16** (1), 1-24.
- German Federal Ministry for Economy and Technology (2011). Information on the EXIST-programme. Website http://www.exist.de/englische_version/index.php, last access: 04 Oct 2012.

- Haase, H. and Lautenschläger, A. (2009). Impact of a Simulation-Based Pedagogy in Entrepreneurship Education: Comparative Insights from Germany, Spain, Thailand and China. *International Review of Entrepreneurship* **7** (4), 327-352.
- Haase, H. und Lautenschläger, A. (2011a). The Myth of Entrepreneurship Education: seven Arguments against Teaching Business Creation at Universities. *Journal for Entrepreneurship Education*, **14**, 147-161.
- Haase, H. und Lautenschläger, A. (2011b). The 'Teachability Dilemma' of entrepreneurship. *International Entrepreneurship and Management Journal*, **7** (2), S. 145-162.
- Halbfas, B.G. (2006). Entrepreneurship Education an Hochschulen – Eine wirtschaftspädagogische und –didaktische Analyse. Dissertation Bergische Universität Wuppertal, Paderborn: Eusl.
- Klandt, H. (2004). Entrepreneurship Education and Research in German-Speaking Europe. *Academy of Management Learning and Education* **3** (3), 293-301.
- Klandt, H., Koch, L. T., and Knaup, U. (2005). Entrepreneurship-Professorships 2004 – A Study on Entrepreneurship Research and Education at German Higher Education Institutions. Bonn: FGF e.V.
- Klandt, H., Koch, L., Schmude, J. and Knaup, U. (2008). FGF-Report Entrepreneurship-Professorships. A Study on Entrepreneurship Research and Education at German Higher Education Institutions. Bonn: FGF e.V.
- Kuckertz, A. (2011). Entrepreneurship Education – status quo and prospective developments. Keynote paper presented at the *UYK 2011 – International Higher Education Congress: New Trends and Issues*, Istanbul, Turkey.
- Kulicke, M. (2010). Interview "EXIST im Dialog", German Federal Ministry for Economy and Technology (<http://www.exist.de/exist/dialog/00913/index.php>), last access: 04 August 2012.
- Kuratko, D. (2005). The Emergence of Entrepreneurship Education: Development, Trends and Challenges. *Entrepreneurship Theory and Practice* **29** (5), 577-597.

- Martin, B. C., McNally, J. J., and Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing* **28** (2), 211-224.
- McClelland, D. C. (1987). Characteristics of Successful Entrepreneurs. *Journal of Creative Behaviour* **21** (3), 219-233.
- Mueller, S. (2009). Encouraging Future Entrepreneurs: The Effect of Entrepreneurship Course Characteristics on Entrepreneurial Intention. Dissertation Universität St. Gallen/ Switzerland, 293 pages.
- Mwasalwiba, E. S. (2010). Entrepreneurship Education: a review of its objectives, teaching methods, and impact indicators. *Education + Training* **52** (1), 29-31.
- OECD (2006). The Oslo Agenda for Entrepreneurship Education in Europe. Available at http://ec.europa.eu/enterprise/policies/sme/files/support_measures/training_education/doc/oslo_agenda_final_en.pdf, last access: 24 April 2013.
- Peterman, N. and Kennedy, J. (2003). Enterprise Education: Influencing Students' Perceptions of Entrepreneurship. *Entrepreneurship Theory and Practice* **28** (2), 129–135.
- Pittaway, L. and Cope, J. (2007). Entrepreneurship Education: A Systematic Review of the Evidence. *International Small Business Journal* **25** (5), 479-510.
- Schleinkofer, M. and Kulicke, M. (2009). Entrepreneurship Education an deutschen Hochschulen – Studie der wissenschaftlichen Begleitforschung zu "EXIST – Existenzgründungen aus der Wissenschaft". Stuttgart/ Germany: Fraunhofer Verlag.
- Schmette, M. (2007). Entrepreneurship und Entrepreneurship Education in Deutschland. In: Remmele, B., Schmette, M. und Seeber, G. (eds.). *Educating Entrepreneurship. Didaktische Ansätze und europäische Perspektiven*. Wiesbaden/ Germany: Deutscher Universitäts-Verlag, 57-74.
- Schumpeter, J. A. (1934). *The Theory of Economic Development*. Cambridge, MA: Harvard University Press.
- Solomon, G. (2007). An examination of entrepreneurship education in the United States. *Journal of Small Business and Enterprise Development*, **14** (2), 168–182.

- Sternberg, R. and Lueckgen, I. (2005). *Global Entrepreneurship Monitor. Unternehmensgründungen im weltweiten Vergleich, Country Report Germany 2004. Sonderthema: Gründungsbezogene Ausbildung*. Köln: Wirtschafts- und Sozialgeographisches Institut, University Cologne/ Germany.
- Timmons, J. A. (1994). *New venture creation: Entrepreneurship for the 21st century*. (4th ed.). Burr Ridge, IL: Irwin Press.
- Uebelacker, S. (2005). *Gründungsausbildung: Entrepreneurship Education an deutschen Hochschulen und ihre raumrelevanten Strukturen, Inhalte und Effekte*. Wiesbaden: Deutscher Universitäts-Verlag.
- Volkman, C., Karen, E., Mariotti, S., Rabuzzi, D., Vyakarnam, S. (2009). *Educating the Next Wave of Entrepreneurs*. Cologne: World Economic Forum.
- Walterscheid, K. (1998). *Entrepreneurship Education als universitäre Lehre*. Diskussionsbeitrag Nr. 261 des Fachbereichs Wirtschaftswissenschaft der FernUniversität Hagen.
- Wilson, K. (2008). Entrepreneurship Education in Europe. In: Potter, J. (ed.). *Entrepreneurship and Higher Education*. Paris/ France: OECD Publications, 119-138.